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the intensive method. It required great courage on the part of Dr. Peter, Dr. Lutaud, and others in France, and Dr. B. W. Richardson in England, to oppose the fashion. Had they not been actuated by a pure love of science, they would have been silenced. It is, however, not unsafe to prophesy that the intolerance of the new school in France, as shown in its treatment of Professor Peter, will bring about its own downfall.

Have we any treatment, then, that is satisfactory, based on these discoveries? The only answer to this question must be an emphatic "No!" The clinical observer has been very patient, knowing that he could afford to wait. Professor Peter, one of the greatest of contemporary clinical observers, and the worthy successor of Trousseau, has endeavored to save medicine from the reign of terror formed by the coterie which, in the name of science, anathematized all who ventured to doubt their theories. "You are unscientific," said the coterie; "you do not believe in our methods of modern research, and you cannot have a hearing." This kind of language has silenced many, because, when there is a fashion, men foolishly imagine that they will be looked on as progressive if they go with the tide. Martyrdom is not so eagerly sought after; and social ostracism is the penalty, too often, for appearing in a minority, as did M. Peter at the Academy. Clinical observers may, however, take heart: there are signs that the cloud will lift, and that medicine will yet be emancipated from the trammels of what has been so well called "vaccinomania."

BOOK-REVIEWS.

Advanced Physiography. By JOHN THORNTON. London and New York, Longmans, Green, & Co. 12°. \$1.40.

THIS book treats of advanced physiography as defined by the syllabus of the Science and Art Department of South Kensington, London. It embraces a concise statement of astronomy; an account of the size, shape, and density of the earth; a brief consideration of atmospheric and oceanic movements and of terrestrial magnetism; and some mention of certain other things on which questions might be asked in the science and arts examinations. Several sample examination-papers are appended, so that the student may, as it were, see what he is studying for. The examinations certainly are of value, and tend to turn school studies in directions approved of by competent educators; but, when it comes to writing a book to meet the examinations, the lover of pedagogics may well rebel. Mr. Thornton has done his task conscientiously. He has searched through good works for his materials, and has said something of every thing that the most ingenious examiner could ask about, and said it concisely and well, as a rule. He has avoided the staleness of old text-books, and has introduced many results of recent investigations; but, for all this, his book still leaves the impression of leading its students to South Kensington, rather than to good mental training. Moreover, the frequent wholesale quotation from other text-books gives the impression that the author is too greatly a compiler, and too little an investigator. In these modern days, when the preparation of school-books is considered worthy work for the director of the Geological Survey of Great Britain, for the superintendent of our Nautical Almanac Office, and for other eminent scholars, it makes us a little impatient to meet a book that is so distinctly a compilation as this one is; but perhaps we lay too great emphasis on this point. Books on physiography, as here defined, must be in great part compilations.

If not an investigator, the author is evidently a practised teacher; and his chapters, paragraph headings, and illustrations show an aptitude in methods of statement and explanation that must bear good result. The careful account of the different methods of finding the masses of the planets, the full description of modern spectroscopy, and the extended chapter on comets and meteors, may be cited in evidence of this. The accounts of the tides and of the winds are distinctly less successful. Occasional lapses appear, such as, "Heat and light are forms of radiant energy," or as latitude being shown as an angle at the centre of the earth, or as making our tornadoes identical with West Indian hurricanes and Chinese typhoons; but errors of even this minute

kind are not common. Condensation of statement in certain chapters will either leave much work for the teacher, which is not objectionable if he is equal to it, or will leave the scholar in a very confused state of mind; and this leads back to our starting-point, that a book prepared to enable students to meet examinations is not the best kind of a book for securing intellectual training.

Graphical Statics. By LUIGI CREMONA. Tr. by Thomas H. Beare. Oxford, Clarendon Pr. 8°. (New York, Macmillan, \$2.25.)

THOSE who are accustomed to make use of mathematics as a tool, and who are not able to ascend into the higher regions of pure mathematics farther than is necessary to secure their practical ends, especially the engineer seeking the solution of the problems in kinematics and in mechanics that come to him in the course of his regular professional work, often have occasion to remark upon the extremely limited range of problems which are capable of solution by algebraic processes, and upon the greater effectiveness of the geometric methods. A glance at any treatise, on any branch of engineering, will show how narrow is the field of application of the algebraic systems to the practical work of the constructor. Where the elements are few, the conditions very simple, and the results sought similarly easy of expression, algebraic methods come in play; but, as in astronomy, the introduction of a little wider generalization, of a single new condition, often carries the problem entirely outside the field of application for the algebraist. Algebra does marvellous work, but its limits are soon reached. Graphical methods are often found to be far more satisfactory, not only in their ease of application, but in the readiness with which the results may be comprehended and translated into the language, and represented by the work of every-day practice. Thus it happens that "graphical statics" has come forward, within a very short time, as the most valuable tool of the engineer.

The father of the system, in some sense, is the well-known Culmann, whose treatises have been translated into English by Du Bois; but some work had been done even before he attempted collating and systematizing it. Rankine did much in this field; and many minor writers have added, each his mite, to the subject. We observe that Cousinery is credited with many contributions to the subject by the writer of this latest treatise. Professor Cremona begins by the presentation of the system of signs adopted, in which he follows Moebius, and then takes up the work in the usual way, giving the standard methods of arithmetical treatment, the graphics of the four rules; the discussion of the processes of graphical involution and evolution; the solution of numerical equations; and the discussion of the centroids. The second part consists of a discussion of reciprocal figures, including Rankine's theory of structures and polygonal frames, and Culmann's work in the same department. The work is well written, the system satisfactory, and the methods in detail logical and exact. Professor Beare is entitled to commendation for his admirable translation; and both he and its author deserve much from the English-speaking reader and student of "Graphical Statics."

Like all the work of the Clarendon Press, the book-making is excellent, and deserving of all praise.

Cycling Art, Energy and Locomotion. By ROBERT P. SCOTT. Philadelphia, Lippincott. 12°.

THIS is an interesting little 12mo treatise on the art of the wheelman, which, in a space of three hundred pages, gives a good historical summary, and an account of the later forms of the wheel, and of the principles of their construction and operation, and presents the mathematical and scientific principles of their balancing and propulsion. One of the most interesting chapters in the book is that in which the author gives the graphical measurements obtained by him with an autographic apparatus devised by himself to record the resistances to the motion of the machine and the pressures of the foot on the pedal. Exact knowledge on these points has not heretofore been obtainable, and this investigation is a real contribution to our knowledge in this field. The

"cyclograph" will undoubtedly do much service hereafter. An analysis of the motions of the machine as it passes over obstructions is also likely to prove of value in the promotion of safety, and in the elimination of the "header" from the list of casualties.

A chapter on ball-bearings includes a discussion of the subject by Professor S. W. Robinson, which is a valuable contribution, especially as giving the limit of weight allowable for balls of any given size. The co-efficient of friction for a one-inch ball is given as about 0.00175, as derived from experiments upon the Lick telescope. The book is full of interesting information for the wheelman, and abounds in good reading for all those who are interested in the subject.

Steam. By WILLIAM RIPPER. London and New York, Longmans, Green, & Co. 12°.

THIS is a little primer of steam and the steam-engine. It is a reproduction of notes of lectures addressed by its author to an evening class of young "mechanical engineers" (the term is evidently not applied to the class usually considered to be represented by it in this country), and includes a course of discussions of steam-engines, boilers, and accessory subjects.

Within these two hundred pages are compressed the best compendium of the subject that has yet been published. It is also, so far as we have been able to discover, accurate, and is evidently written by an engineer familiar with the science and the art, and not, as is too often the case where these primers are produced, by an amateur or tyro hardly more familiar with the subject than those to whom his instruction is offered. A preliminary discussion of the physical properties of steam, the chemical principles of combustion, and the elements of thermodynamics, is followed by a brief description of the modern steam-engine, its construction, and its performance, which is really of value, and might well repay the professional for the time required to read it. The book is well illustrated, in the sense of having a good list of engravings, though their quality as specimens of the engraver's art may not be reckoned high, in the opinion of the expert. The compound

engine is described, and its principles summarized, and the book is concluded by a chapter on the management of engines and boilers.

AMONG THE PUBLISHERS.

WE have received No. 30 of "Odds and Ends from the Literary Junk Shop," by A. S. Clark of 34 Park Row, this city.

—"Education as a Factor in Civilization" is the title of an essay by Caroline B. LeRow in the *Modern Science Essayist* for June 15. In the issue of July 1 John W. Chadwick treats of "Evolution and Social Reform," dealing mainly with "The Theological Method."

—Painters—and by this we mean artists, and not carriage or house painters—are not, as a class, persons likely to take interest in the chemistry of paints and painting. Yet it appears that the Royal Academy of Arts in London has a professor of chemistry in the person of A. M. Church, a master of arts, and fellow of the Royal Society; and this same Professor Church has written a "Chemistry of Paints and Painting," which is published in New York by Macmillan. The book is intended for those who use paints, and is meant as a help, that paints and varnishes may be well chosen and properly used. It is not expected that any one will read the book through, but that information will be sought within its covers as occasion may occur. It has therefore happened that to some extent the same matter has been inserted under more than one heading in the book. The book is unique in its field, and should be available to all likely to be interested.

—Mr. Arthur H. Noll has written "A Short History of Mexico," which has been published by A. C. McClurg & Co. of Chicago. The author states in his preface that he has been unable to find any comprehensive history of Mexico in the English language, and he has accordingly endeavored to make up the deficiency. We wish we could say that he has succeeded; but in fact his work is extremely unsatisfactory. He has no intelligent concep-

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